

CLAIMS

1. An orthotic device comprising:
an orthosis body adapted to be wrapped around the torso of a wearer of the device, the orthosis body having at least two segments in juxtaposed relationship;
means provided at free end portions of said at least two segments to releasably secure said free end portions to one another;
at least two cables, each cable operatively connected to said at least two segments;
at least two sets of pulleys mounted on said at least two segments with each cable operatively connected to said at least two segments running through a pulley on each of said at least two segments in alteration, shortening of each cable pulling said at least two segments together and tightening the orthotic device with the aid of a mechanical advantage dependent upon the number of pulleys mounted on each of said at least two segments.

2. An orthotic device according to claim 1, wherein said at least two segments comprise two segments, said at least two sets of pulleys comprise two sets of pulleys and said at least two cables comprising two cables.

3. An orthotic device according to claim 2, wherein said two sets of pulleys are disposed vertically with respect to each other at juxtaposed edges of said two segments.

4. An orthotic device according to claim 2, wherein each cable is operatively associated with a separate set of pulleys.

5. An orthotic device according to claim 4, wherein each set of pulleys with an associated cable provides a mechanical advantage of about 4:1 to about 30:1.

6. An orthotic device according to claim 1, wherein each set of pulleys comprise two banks of pulleys and each bank of pulleys of a set of pulleys is mounted on a juxtaposed edge of an adjacent segment.

7. An orthotic device according to claim 1, wherein each of said at least two cables is an endless cable.

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8. An orthotic device according to claim 1, wherein each of said at least two cables comprise cables having two free ends secured to a handle element.

9. An orthotic device according to claim 6, wherein each bank of pulleys includes a plate on which pulleys are mounted, said plate being detachably mounted on a segment of said at least two segments.

10. An orthotic device according to claim 1, wherein said detachable securing means comprise portions of hook-and-loop fastener material disposed on overlapping portions of said free end portions of said at least two segments.

11. An orthotic device according to claim 1, wherein at least a portion of each of said at least two segments is formed from a rigid material.

12. An orthotic device according to claim 1, wherein said at least two segments comprise at least three segments, said at least two sets of pulleys comprise two sets of pulleys and said at least two cables comprise two cables.

13. An orthotic device according to claim 12, wherein said at least three segments comprise at least one central segment having first and second opposed lateral edges, at least one first lateral segment disposed at said first opposed lateral edge of said at least one central segment and at least one second lateral segment disposed at said second opposed lateral edge.

14. An orthotic device according to claim 13, wherein said two sets of pulleys are disposed horizontally with respect to each other and includes a first set of pulleys mounted on said at least one central segment and said at least one first lateral segment, and a second set of pulleys is mounted on said at least one central segment and said at least one second lateral segment.

15. An orthotic device according to claim 12, wherein each cable is operatively associated with a separate set of pulleys.

16. An orthotic device according to claim 15, wherein each set of pulleys with an associated cable provides a mechanical advantage of about 4:1 to about 30:1.

17. An orthotic device according to claim 8, wherein each handle element has mounted thereon a portion of a hook-and-loop material complementary to a portion of a hook-and-loop material disposed on an outer surface of said at least two segments.

18. An orthotic device according to claim 17, wherein said handle element is formed from a flexible material.

19. An orthotic device according to claim 1, wherein lordotic pads are mounted at inner surfaces of the orthosis body, symmetrically and at substantially the center of the orthosis body.

20. An orthotic device according to claim 1, wherein each set of pulleys comprise two banks of pulleys, each bank of pulleys including at least one pulley having a spool diameter different in size than remaining pulleys in the set.

21. An orthotic device according to claim 13, wherein each free edge of said at least one first lateral segment and said at least one second lateral segment has a grasping element attached thereto.

22. A thoracic lumbar sacral orthosis comprising:
a rigid front piece;
a sternal notch piece, movably and adjustably secured to said rigid front piece;
a rigid rear piece, removably and adjustably secured to said rigid front piece; and
a body brace comprising:
a brace body adapted to be wrapped around the torso of a patient, said front piece and said rear piece, said brace body comprising at least two brace body segments;
means provided at free end portions of said at least two brace body segments for detachably securing the two free end portions together around the patient's torso;
at least one cable operatively connected to said at least two brace body segments; and

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at least one set of pulleys mounted on each of said at least two brace segments with the cable running through a pulley on each segment in alteration, shortening of the cable pulling the at least two brace body segments together and tightening the body brace with the aid of a mechanical advantage dependent upon the number of pulleys mounted on each of said at least two brace body segments.

23. A thoracic lumbar sacral orthosis according to claim 22, wherein said body brace is removably and adjustably secured to said front piece and said rear piece.

24. A thoracic lumbar sacral orthosis according to claim 23, wherein outer surfaces of said front piece and said rear piece include portions of hook-and-loop material complementary to portions of hook-and-loop material on at least a portion of an inner surface of said brace body.

25. A thoracic lumbar sacral orthosis according to claim 22, wherein said at least two brace body segments comprise at least three segments, said at least two sets of pulleys comprise two sets of pulleys and said at least one cable comprises two cables.

26. A thoracic lumbar sacral orthosis according to claim 25, wherein said at least three segments comprises at least one central segment having first and second opposed lateral edges, at least one first lateral segment disposed at said first opposed lateral edge of said at least one central segment and at least one second lateral segment disposed at said second opposed lateral edge.

27. A thoracic lumbar sacral orthosis according to claim 26, wherein said two sets of pulleys are disposed horizontally with respect to each other and includes a first set of pulleys mounted on said at least one central segment and said at least one first lateral segment, and a second set of pulleys is mounted on said at least one central segment and said at least one second lateral segment.

28. A thoracic lumbar sacral orthosis according to claim 25, wherein each cable is operatively associated with a separate set of pulleys.

29. A thoracic lumbar sacral orthosis according to claim 28, wherein each set of pulleys with an associated cable provides a mechanical advantage of about 4:1 to about 30:1.

30. A thoracic lumbar sacral orthosis according to claim 25, wherein each of said at least two cables comprise cables having two free ends secured to a handle element.

31. A thoracic lumbar sacral orthosis according to claim 30, wherein each handle element has mounted thereto a portion of a hook-and-loop material complementary to a portion of a hook-and-loop material disposed on a surface of said at least two segments.

32. A thoracic lumbar sacral orthosis according to claim 31, wherein said handle element is formed from a flexible material.

33. A thoracic lumbar sacral orthosis according to claim 26, wherein each free edge of said at least one first opposed lateral segment and said at least one second opposed lateral segment has a grasping element attached thereto.

34. A thoracic lumbar sacral orthosis according to claim 22, wherein said at least two brace body segments comprise two segments, said at least one set of pulleys comprise two sets of pulleys and said at least one cable comprises two cables.

35. A thoracic lumbar sacral orthosis according to claim 22, wherein said sternal notch piece includes an adjustment piece and said front piece includes an adjustment piece receiving portion provided with an adjustable member for engaging said adjustment piece.